the tar in its natural state as it comes from the gas-works, a less economical, but a much better article is employed, more liable to soften, but less liable to break and crumble away.

In Glasgow, where there is no Buildings' Act, rendering compulsory the use of parapets, the houses are, to a great extent, without that feature, the ordinary finish being a cornice and blocking-course; the consequence of which is that in winter, during boisterous weather, many chimney-pots are blown into the streets, to the imminent peril of her Majesty's liege subjects. The evil I allude to is common to this and other towns exempt from legislative interference in matters structural; and even where life and limb may be safe, the vast amount of expense annually incurred in the damage to roofs, partly by the falling off of the ill-favoured appliances referred to, and partly in the breakage by slaters employed to replace them, whether knowingly or unmeditated, is of itself highly suggestive of endeavours to find means for its mitigation. The mode in which I avoided the latter part of the evil, consisted in inserting in the stone chimney cap a cast-iron socket for receiving the lower end of the funnel, which I made also of cast-iron: the fitting together of the funnel and socket was ensured by their meeting surfaces being turned, and both being tapered downwards. The socket is steadied by three projecting stubs, flush with the top of the stone cap; and the funnel is provided also with three stubs round its circumference at the mouth, as a provision for its receiving one of the common clay caps, should such be found desirable. It is besides surrounded at the base, with a projecting flange to protect the socket joint. I may remark, in passing, that the principle of the common old-fashioned chimney-pot and cap appears to me to be fully as philosophical as that of any of the tortuous contrivances of the present day, by which smoke is endeavoured to be wheedled into a rebellion against natural laws. The cap is usually put on for the mere purpose of lengthening the funnel, or, perhaps, as a finish to it: the more subtle consideration that the course of the ascending column will be accelerated by the current created in the cylindrical space preserved between them by the stubs, forming no part of the argument. That, however, we may consider of minor importance, if benefit be derived from the practice; only, it is remarkable that, in practice, we find many things done on philosophical principles for a long while before the fact of their being so is detected. In many cases these principles have been set out with by the inventor, and afterwards get completely overlooked, and allowed to lie dormant, like the symbolism and geometry of the middle-age architects.

In order to obtain a commodious attic, with a roof perfectly exempt from outward thrust, I constructed it as shewn in Fig. 2, the circular ribs being each composed of five 1½ inch flitches, cut circular only on their under edge, and the abutting-joints breaking bond twice in each length: in each haunch of the arch, there is an iron casting which takes the place of a portion of the middle flitch, and, by an extension downwards, affords the means of tying the roof together under the floor-boarding; accompanying this, which may be considered the web of the casting, a level portion about 2½ feet long, serves as a template or bearing-plate for the arch ribs, and, turning up on the outer edge, furnishes also an abutment for the pole-plate—to resist any thrust in the common-rafters. A lateral return also of the lower portion of the web, on either side, giving it a T section in that part, tends further to give it stability and strength: the tie is of 1¼ inch bolt-iron, forked at either end, and with an elongated eye in each prong, for receiving a pair of wedges, which pass through the web of the castings, and tighten the rods to their proper degree of tension. The arch-ribs are placed about 12 feet apart; at one end of the building there is a return wing at the back, which renders necessary a diagonal rib of a considerably larger span; this is formed of seven flitches. In the interior, the soffit of the ribs is lined with wood, beaded on the angles, and the sides plastered; the purlins also are cased in wrought and beaded lining: ceiling-joists are carried between the two centre purlins to carry the plaster lining across horizontally. Fig. 3 represents one of the haunch irons.

From a fourth to a third of the small apertures which appear like dots along the principal cornice in the elevation, are perforations about 3 inches in diameter through the wall, at the level of the skirting in front and rear of the attic, for the purpose of ventilation: the escape of the impure air is provided for by valved wooden trunks, leading from the ceiling to round zinc chimneys behind the ridge, having raised conical caps, with smaller inverted cones inside of same to facilitate escape.

In the plumbing department, stop-cocks having screwed nozzles, are provided on the several levels, for attaching hose to, as a precaution against fire,—the standing mains being 2-inch, and the water at high-pressure.

JAMES WYLSON.

THE THEATRES AND PORTICOES OF ANCIENT ROME.

BY THE REV. E. BURGESS, B.D.*

THE remains of the theatre of Marcellus are worthy of the architect's admiration. Eleven arches of both orders and part of a twelfth are conspicuous, though mutilated and disfigured by the dusky habitations into which they have been metamorphosed. The first order is nearly half interred, but the capitals of the Doric columns, as well as the entablature, are well preserved in several places. The second story exhibits a specimen of the Ionic order, as it was brought to perfection in the age of Augustus. Within those arches which formed the "ambulacra," as in the amphitheatre, the "gradus spectaculorum" rose, and some of the "cunei" may be traced in the stables of the Osteria della Campana. The materials are Tufo, mingled with brickwork, resembling those in Pompey's theatre, and one may perceive by a solitary column in the Via Savelli, standing at an angle with a piece of wall running in the direction of the scena, that the stage and its outworks must have touched the very banks of the river. The Palazzo Orsini, formerly Savelli, is built upon the ruins of the stage. Piranesi has calculated the capacity of this theatre to contain 25,000 persons; it was therefore the smallest of the three. Julius Cæsar, perhaps, laid the foundation of this edifice, but it was left for Augustus to complete it, and he dedicated it with the name of the Young Marcellus. On the feast of the dedication it is said that 700 wild beasts from Africa were consumed, and then, for the first time in Rome, there was seen a tamed tiger. We have an account of a fire having partly destroyed this theatre, but we hear very little of its history until Pierleone, in the twelfth century, made it a fortress. It passed successively into the possession of the Savelli and Orsini families, and there is no reason to suppose it has existed otherwise than it now presents itself for several centuries: in Carnucci's Antiquities, we have a drawing of it, bearing date 1565, and it is there exhibited just as we see it at the present time. I may mention that its exterior walls are of travertine stone. The 25,000 spectators are now replaced by some workers in charcoal and some mules, the former occupying the places reserved for the magistrates, and the mules having taken possession of what was the orchestra. Near to the theatre of Marcellus stood the famous portico of Octavia, to which I have finally to call your attention. And although we must penetrate into the filthiest habitations in Rome, among stinking fish, in order to see the remains of this splendid work, it will amply repay us for our excursion, and stamp indelibly upon our memories the flavour of the Pescheria and the conservative habits of the Jews who live within the portico of Octavia.

The first marble building ever erected at Rome was a portico which stood on this self same site. It was built by Metellus Macedonicus: two temples were comprised within it. The architects were two Spartans, whose names were Sauros and Batrachus. They not only contributed their skill, but, as they were rich men, they employed their wealth also in the undertaking. The only reward for their services which they asked of the Romans was that their names might be mentioned in an inscription on the temples; but this honour being refused, they contrived to introduce their names allegorically: Sauros meaning a lizard, and Batrachus a frog—those animals were introduced into the capitals of the columns. The architects of the portico of Octavia were also Spartans, and they respected the works of their distinguished countrymen. The new portico comprised in its circuit, the two temples, made more magnificent and probably much enlarged: the fragment of the Pianta Capitolina, with the mutilated inscription "CVS OCTAVIAE," gives us the plan of those splendid works. Bellori, in his illustration, computes about 270 columns. I confess I cannot make out that number with the utmost stretch of my feeble imagination, but I can present you with a plan made on the authority of the fragment and the ruins which still exist, adjusted on the dark tints, which shew them in their proper places. By this plan, it will be seen that the principal remains consist in six large columns of the vestibule or entrance (and who that has seen Rome has not admired the magnitude and elegance of those Corinthian columns), eight more columns of the exterior row of the Perystyle, which are only to be seen by contending with the fish-stalls made out of the spoils of the portico; and there are also further remains of one of the temples to be seen in a Vicolo behind the church of St. Angelo: three columns standing at an angle indicate the position of the prostyle of the Temple of Juno, the other was dedicated to Jupiter. I must leave you gentlemen to rear from this ground-plan, and from the splendid vestiges which remain, the elevations and architectural views of the portico and its temples; but even your ingenuity would not be able to restore to their proper niches, or affix on their respective walls, the works of art which once adorned the portico of Octavia. In the Temple of Juno was her statue, made by Dionysius and Polycles; and a Venus by Philiscus of Rhodes. In the corresponding Temple of Jove was the much admired statue of the god, which was equally well executed by those sons of Timarchus. There was a group representing Pan and Olympus wrestling together, the work of Heliodorus; and perhaps the Venus of exquisite beauty which Pliny tells us adorned this portico (the work of Phidias) may be the very Venus de Medici which Santo Bartoli declares was found here in the Pescheria. In a part of the building called the Schola Octaviæ was the famous Cupid of Praxiteles, which called forth the eulogia of Cicero, Strabo, and Pausanias. It is more than probable that several of those statues perished in the fire which took place in the reign of Titus, and still more might be lost in that which happened under Sep. Severus. The paintings which adorned the walls and vaults were not less celebrated. There was the famous work of Artemon representing Hercules ascending from Mount Oeta to Olympus, having put off his mortality with the consent of the gods; there was the painting by Antiphilus, where four figures of satyrs were grouped around the noble Hesion; and Alexander and Philip, with Minerva. You may exhibit to us an elevation restored; a few columns will direct you to complete the portico, and a medal will give you a finish for the pediment. You may square us off the basements, and crown the balustrade with colossal statues and urns; and you may festoon or tryglyph the entablature; but you cannot paint afresh the works of Artemon and Antiphilus, nor mould again the forms which the innate flash of the mind of a Phidias or a Praxiteles could produce. You must therefore be content with the bare recital, and inscribe upon the very best edifice I can describe, "*Stat nominis umbra.*" But you will remark in the enumeration of the names of those celebrated artists, that they were all foreigners, and Rome owed her most splendid works of art, I may say all of them, to the Greeks, and they owed much of their theatrical amusements to the Syrians and Egyptians. It is, in fact, a mistake to attempt to nationalise either art or science. If there be such a thing as communism in the world, it exists in the realms of genius, and no petty jealousy should ever attempt to exclude the foreigner who brings his originality of thought and genius to adorn a country of which he is not a native. It was written over the tomb of Ludlow, in Switzerland, "*Omne solum forti-*

* See p. 329, *ante*.

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